

WHAT IS CLAIMED IS:

- 1 1. A magnetic recording medium comprising:
2 a substrate; and
3 a multilayered portion formed on the substrate comprising a first seed layer, a
4 second seed layer, a first underlayer, a second underlayer, and a magnetic layer,
5 wherein the second seed layer comprises at least A1 and one of Ru and Re,
6 wherein the first underlayer comprises at least one of Co and Ni and one or
7 both of A1 and Ti.
- 1 2. The magnetic recording medium according to claim 1, wherein the first
2 seed layer comprises at least from 35 to 65 % atomic weight of Ti and from 35 to 65 %
3 atomic weight of A1.
- 1 3. The magnetic recording medium according to claim 1, wherein the first
2 seed layer comprises at least Cr and one or both of Ti and Ta.
- 1 4. The magnetic recording medium according to claim 1, wherein a
2 thickness of the second seed layer is in the range of 0.3 to 10 nm.
- 1 5. The magnetic recording medium according to claim 4, wherein the first
2 seed layer comprises at least from 35 to 65 % atomic weight of Ti and from 35 to 65 %
3 atomic weight of A1.
- 1 6. The magnetic recording medium according to claim 4, wherein the first
2 seed layer comprises at least Cr and one or both of Ti and Ta.
- 1 7. The magnetic recording medium according to claim 1, wherein a
2 thickness of the second seed layer is in the range of 0.3 to 5 nm.
- 1 8. The magnetic recording medium according to claim 7, wherein the first
2 seed layer comprises at least from 35 to 65 % atomic weight of Ti and from 35 to 65 %
3 atomic weight of A1.
- 1 9. The magnetic recording medium according to claim 7, wherein the first
2 seed layer comprises at least Cr and one or both of Ti and Ta.

- 1 10. The magnetic recording medium according to claim 1, wherein a
2 thickness of the first underlayer is in the range of 5 to 30 nm.
- 1 11. The magnetic recording medium according to claim 10, wherein the
2 first seed layer at least contains from 35 to 65 % atomic weight of Ti and from 35 to 65 %
3 atomic weight of A1.
- 1 12. The magnetic recording medium according to claim 10, wherein the
2 first seed layer at least contains Cr and one or both of Ti and Ta.
- 1 13. A magnetic recording medium comprising:
2 a substrate; and
3 a laminated layer formed on the substrate,
4 the laminated layer comprising a first seed layer, a second seed layer, a first
5 underlayer, a second underlayer, and a magnetic layer,
6 wherein the second seed layer comprises Cr or a Cr alloy containing Cr and at
7 least one element selected from the group A consisting of: Ti, Mo, and W,
8 the first underlayer comprising at least one of Co and Ni,
9 the first underlayer further comprising one or both of A1 and Ti.
- 1 14. The magnetic recording medium according to claim 13, wherein the
2 first seed layer comprises at least 35 to 65 % atomic weight of Ti and at least 35 to 65 %
3 atomic weight of A1.
- 1 15. The magnetic recording medium according to claim 13, wherein the
2 first seed layer comprises at least Cr and one or both of Ti and Ta.
- 1 16. The magnetic recording medium according to claim 13, wherein a
2 thickness of the second seed layer is in the range of 0.3 to 7.5 nm.
- 1 17. The magnetic recording medium according to claim 16, wherein the
2 first seed layer comprises at least 35 to 65 % atomic weight of Ti and at least 35 to 65 %
3 atomic weight of A1.
- 1 18. The magnetic recording medium according to claim 16, wherein the
2 first seed layer comprises at least Cr and one or both of Ti and Ta.

1 19. The magnetic recording medium according to claim 13, wherein a
2 thickness of the second seed layer is in the range of 0.3 to 2.5 nm.

1 20. The magnetic recording medium according to claim 19, wherein the
2 first seed layer at least contains from 35 to 65 % atomic weight of Ti and from 35 to 65 %
3 atomic weight of Al.

1 21. The magnetic recording medium according to claim 19, wherein the
2 first seed layer at least contains Cr and one or both of Ti and Ta.

1 22. A magnetic recording medium comprising:
2 a substrate;
3 a magnetic layer formed atop the substrate; and
4 a multilayered seed layer and a multilayered underlayer formed atop the
5 substrate,
6 wherein an uppermost layer of the multilayered seed layer comprises at least
7 Al and any one of Ru and Re,
8 wherein a lowermost layer of the multilayered underlayer comprises at least
9 one of Co and Ni, and one or both of Al and Ti.

1 23. The magnetic recording medium according to claim 22, wherein the
2 magnetic layer comprises of a plurality of magnetic layers and a nonmagnetic intermediate
3 layer disposed between each pair of magnetic layers, the nonmagnetic intermediate layer
4 comprising either substantially an element selected from the group consisting of: Ru, Cr, Rh,
5 Ir, and Cu or an alloy having as main component an element selected from the group
6 consisting of: Ru, Cr, Rh, Ir, and Cu.

1 24. The magnetic recording medium according to claim 22, wherein a
2 thickness of the multilayered seed layer is in the range of 0.3 to 20 nm.

1 25. The magnetic recording medium according to claim 24, wherein the
2 magnetic layer comprises of a plurality of magnetic layers and a nonmagnetic intermediate
3 layer disposed between each pair of magnetic layers, the nonmagnetic intermediate layer
4 comprising either substantially an element selected from the group consisting of: Ru, Cr, Rh,

5 Ir, and Cu or an alloy having as main component an element selected from the group
6 consisting of: Ru, Cr, Rh, Ir, and Cu.

1 26. The magnetic recording medium according to claim 22, wherein a
2 thickness of the multilayered seed layer is in the range of 0.3 to 5 nm.

1 27. The magnetic recording medium according to claim 26, wherein the
2 magnetic layer comprises of a plurality of magnetic layers and a nonmagnetic intermediate
3 layer disposed between each pair of magnetic layers, the nonmagnetic intermediate layer
4 comprising either substantially an element selected from the group consisting of: Ru, Cr, Rh,
5 Ir, and Cu or an alloy having as main component an element selected from the group
6 consisting of: Ru, Cr, Rh, Ir, and Cu.

1 28. The magnetic recording medium according to claim 22, wherein a
2 thickness of the multilayered underlayer is in the range of 5 to 30 nm.

1 29. The magnetic recording medium according to claim 28,
2 wherein the magnetic layer is composed of a plurality of magnetic layers; and
3 a nonmagnetic intermediate layer comprising Ru, Cr, Rh, Ir, or Cu or an alloy
4 mainly comprising Ru, Cr, Rh, Ir, or Cu is disposed between each magnetic layer.